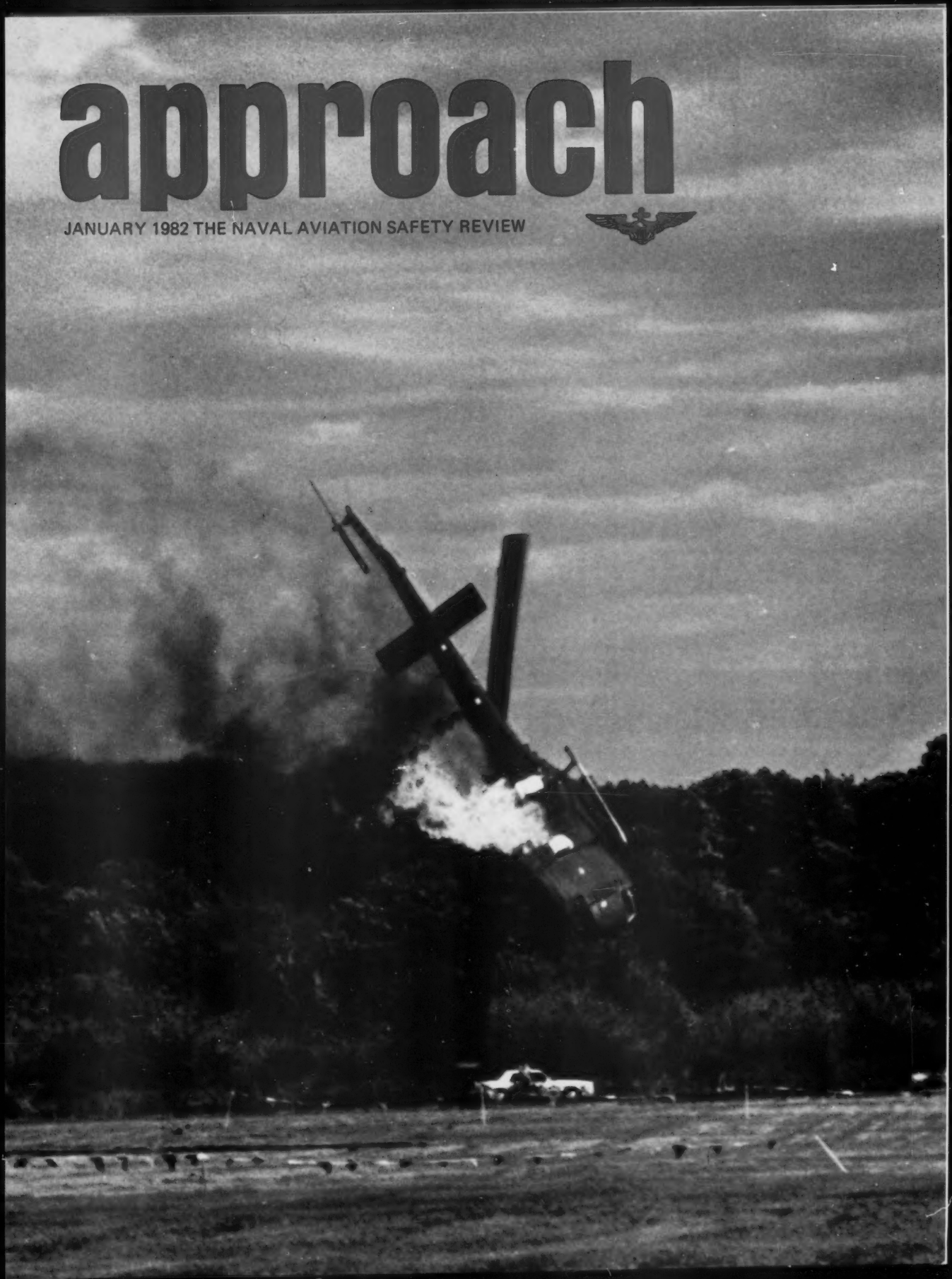
approach

JANUARY 1982 THE NAVAL AVIATION SAFETY REVIEW



Thanks for the help

AS editor of this magazine for 3 years, one thing has made the job a constant pleasure – the support and interest of you, the readers. Your jabs, pats on the back and, most of all, your excellent contributed articles keep the magazine a lively, worthwhile endeavor. It's no secret that your command gets a point toward the CNO Safety Award for every article you submit to *APPROACH*, but the vast majority of your contributions far surpass that motivation. Whatever success *APPROACH* enjoys is a direct result of your taking the time and effort to write your experiences and thoughts on naval aviation safety. The final product is a publication that truly belongs to you.

For any of you who feel *APPROACH* does not reflect the needs and interests of your particular flight community, I have a parting suggestion – write and submit what you'd like to see in the magazine. We have tried to make this process easier by recently printing a Contributor's Guide. This handy little booklet is designed to help you overcome your trepidation and put your ideas on paper. It contains simple guidance on writing a magazine article, in general, and more detailed sections discussing the specific needs of each of our safety publications (*APPROACH, MECH, FATHOM,* and *NAVY LIFELINE*). The pamphlet even has a short section on submitting photographs to the magazines. It can be obtained by calling (804) 444-1321, Autovon 690-1321, FTS 954-1321, or by writing to: Contributor's Guide, Safety Publications Department, Naval Safety Center, NAS Norfolk, VA 23511.

Before I pick up my pencils, coffee cup, and dictionary and walk out the door, I would like to thank all of you for the tremendous help you've been over the last few years. I look forward to seeing *APPROACH* improve as a magazine and as a tool in naval aviation mishap prevention. I encourage each of you to participate in that process.

LT Dale Smith

approach

Vol. 27 No. 7
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The Huey on the cover is a prime example of the topic discussed in this month's lead article. Photographer unknown.

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RADM T. C. Steele, Commander, Naval Safety Center

CAPT Henri B. Chase, Director, Aviation Safety Programs

CDR William J. Isenhour, Head, Safety Publications
LT Dale E. Smith, Editor
LT Colin Sargent, Managing Editor
Robert Trotter, Art Director
Russ T. Forbush, Helicopter Writer
Bill Peters, Fixed-Wing Writer
Blake Rader, Illustrator
Jack LaBar, Illustrator
Frank L. Smith, Graphics
PH3 Ronald K. Bellenot, Photographer
Catherine M. Wizieck, Editorial Assistant
Patricia A. Kinter, Type Composer
Robin C. Miller, Type Composer
Doris Sumner, Circulation

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AIRSHOW HYSTERIA

As old as the ground we are crashing into

THE crowd is hushed with anticipation. Clark Gable, in a deadly silver monoplane, glances down at the spectators, geometric farms, and the tiny civilian airstrip below. He's gonna give those amateurs a show they'll *never* forget. Checking the bubble gum and bailing wire holding his ailerons together, he slams his throttle to a manifold air pressure high enough to bust the guts of heaven, turns his face slightly to the right (for the best profile), and zooms into a sexy, violent *split S* before crashing to the ground in cinematic smithereens.

But wait! Clark Gable doesn't die in this movie, but *you* can. It's hard to believe that professional naval aviators, fliers who have already demonstrated uncommonly sound judgment in order to win their wings, can be lured into executing dangerous, unauthorized maneuvers in the air. But it is true, and the mania isn't limited to any one flight community. Helos, props, and jets have all crashed while performing airshows (authorized or not), with pilot error listed as the primary mishap cause. *Why does it happen?* Let's look at three examples.

All Dressed Up With No Mission to Perform. A northwestern civilian airport was sponsoring a 2-day airshow. The park district in charge of the event mailed a letter to the CO of a helo squadron in the area, requesting that an aircraft be sent to perform a rappelling demonstration at the airfield during an upcoming weekend airshow.

After the mission was approved, the squadron operations officer informed a HAC and a copilot, who were originally scheduled for a cross country training flight, that their cross

The aircraft hit, became airborne again for 370 feet of uncontrolled flight, yawed left, tucked nose under, and exploded.

By LT Colin Sargent and Bill Peters
APPROACH Staff

country had been cancelled due to aircraft availability and that they were reassigned to fly the airshow support mission. The squadron safety officer checked the crew's qualifications, briefed them on possible emergencies, and was satisfied they were fully prepared to conduct the assigned mission.

Arriving at the airfield early Saturday morning, the crew was met by a representative from the local recruiting station that was to provide the rappelling personnel. They were told that, due to injuries previously sustained by rappellers, the rappelling missions for both Saturday and Sunday had been cancelled by the CO of the recruiting unit.

The four-man helo crew was now all dressed up with no rappelling mission to support. The understandably dejected pilots resigned themselves to being a static display until an airshow coordinator asked if they could fill the 10- to 20-minute show slot. Somewhat elated, the HAC and copilot told the airshow officials and the FAA on-site inspectors that they would do a flight demonstration consisting of hovering maneuvers, a quick stop, and an autorotation from 3,000 feet AGL. Although the crew made no mention of acrobatic flight or severe maneuvers, the FAA on-site inspectors briefed the pilots on the "acrobatic box": an area designated on the airfield by red flags, in which any acrobatic maneuver had to be conducted. At approximately 1350, the crew manned their aircraft, took off, flew the prebriefed maneuvers, and returned to their squadron.

On Sunday, the pilot, copilot, crew chief, and fourth crewmember took off from their squadron, arriving at the airshow site at 1040. The crew had breakfast, visited with numerous other aviators participating in the airshow and, at noon, attended the FAA brief for the afternoon demonstrations. Once again, the on-site inspectors mentioned the "acro box" and cautioned against infringement of its fluttering red boundaries.

At 1440, the crew joined up and completed prestart, start, and poststart checks with no known discrepancies. The aircraft lifted off, performed a hover check, made a pedal turn to the right, and departed along a grass runway. The transition to forward flight was normal (6-7 degrees nose low), at an altitude of from 6 to gradually 20 to 30 feet. During the acceleration period, the pilot at the controls made two course corrections to the left, presumably to remain within the "acrobatic box."

An immediate climb to 125 feet was then executed, followed by an unauthorized and poorly executed 90-degree wingover. The aircraft slowed dangerously before reaching the apogee, and another pedal turn was noticeably initiated. The pilot at the controls leveled the wings and attempted to pull out of the maneuver. Not surprisingly, an excessive rate of descent had developed, and the aircraft impacted the ground at an estimated 11.5G. The aircraft hit, became airborne again for 370 feet of uncontrolled flight, yawed left, tucked nose under, and exploded. Prior to final impact, there were multiple rotor blade strikes. One of the crew was thrown from the aircraft, though he was wearing a gunner's belt, and was the only survivor.

Perhaps the most frustrating aspect of this mishap is that the *same pilot and copilot*, only one week earlier at a different airshow, had been approached with another request to participate in a flight demonstration and had refused on the basis of known policies prohibiting such actions. Though the surviving member of the crew was unaware of anyone asking the pilots to perform acrobatic maneuvers, it is easy to see how an invisible pressure began to build within the crew to perform a *sierra hotel* maneuver.

A Deadly Joyride. An all-volunteer VP crew flew to an island city to participate in a holiday celebration. Indicative of their attitude, there were 25 souls onboard the aircraft for the last leg of the flight (exceeding the NATOPS maximum by two).

Upon arrival at the island, the PPC surprised his crew when he executed an impromptu short-field landing, despite the 9,000 feet of usable runway available. After shutdown, the crew said goodbye to the passengers and checked into their hotel rooms.

Continued

...the aircraft descended to approximately 300 feet, swooping over the island without specific ATC clearance and with the obvious intention of making a low, slow pass for the assembled crowd.

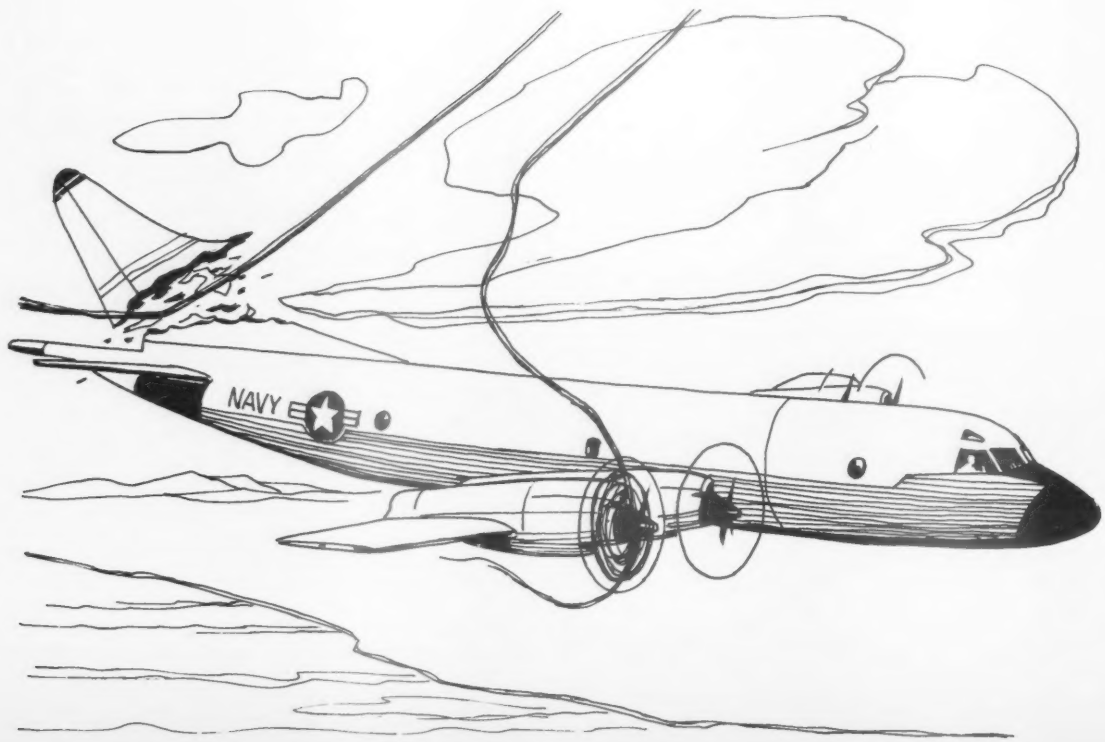
The PPC later conferred with members of the welcoming party, who made a point of briefing him on the location of a 4,800-foot-long tram cable system spanning the bay and rising from 200 feet to over 1,600 feet MSL. This briefing included a warning concerning a recent incident involving a visiting flight demonstration team which narrowly missed this same cable.

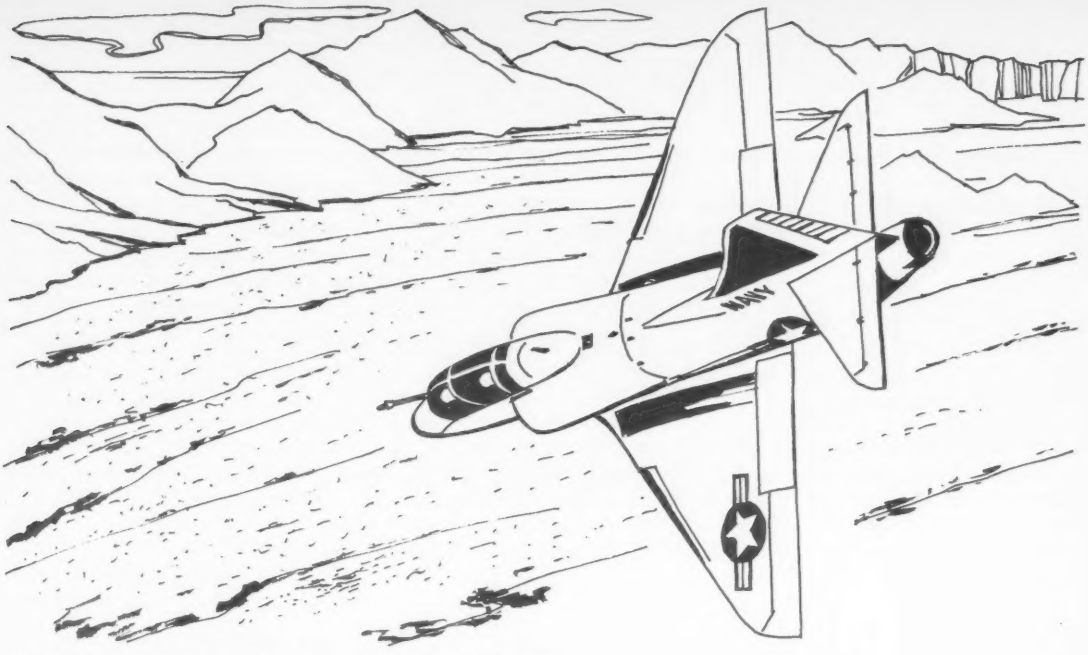
The crew arose early the next day and ate a good breakfast. They were assigned to provide a jump platform for a team of skydivers who were to float down into the festivities. There was no requirement for a flight demonstration, and the PPC had been specifically briefed by his CO, before leaving Homebase, not to consider himself part of an airshow.

Proceeding to the airport, the crew met with the jump team and received instructions on altitude requirements, proximity of high terrain, and the looming hazard of the tram cable system. The customary planeside briefing was not conducted, nor were ditching stations assigned to the jumpers by the PPC or crew.

Prior to engine start, the pilot contacted the tower and inquired about any restrictions on conducting a "low-altitude island tour" following the paradrop. The tower advised that no conflicting traffic existed but stated that positive, two-way voice communications had to be maintained. The aircraft then taxied to the runway, went to full power, and took off, with three of the jumpers observing the takeoff from the cockpit area (another NATOPS violation).

Once at altitude, the crewmember assigned to the main cabin door donned his safety harness, the jumpers leaped out of the aircraft, and the door was secured. Shortly thereafter, the aircraft descended to approximately 300 feet, swooping over the island *without* specific ATC clearance





and with the obvious intention of making a low, slow pass for the assembled crowd. No radio transmissions were received by the tower.

The mishap pass began with the apparent intent of flying under the tram cables, but the No. 4 propellor contacted the lower suspension cable, sheared it, and became wrapped with wire until the propellor shaft became entangled and the engine seized. One of the cables rode along the top of the fuselage and sliced off the vertical stabilizer, which crashed into the bay. Deceleration forces at cable contact, along with the loss of the No. 4 engine, caused a shock of some 12G in the horizontal plane. The impact forces at ground contact were estimated at 80G and were not survivable. The crew of six, and two civilians on the ground, were killed.

This pilot had previously violated several flight regulations – a fact well known by his peers and crewmembers. His commanding officer, however, had never been informed of these transgressions. Was his death the end of a long, predictable story or simply the result of an isolated incident of poor judgment?

A Private Airshow. The fighter's mission was a photo-escort flight for a Navy A-4 ordnance drop at 0905 and an Air Force B-66 parachute drop at 0935. It was a clear February morning. The pilot of the fighter was a lieutenant commander with 9 years of experience in carrier aircraft and over 2,900 hours of military flight time. The backseater was an authorized TO/PH1 qualified to provide photo coverage for the drops. A thorough preflight brief was conducted at NAF Southwest, and the crew was airborne at 0913, following a ground abort of the A-4 portion of the mission.

There was some speculation at the time as to why the pilot took off prior to mission time for the B-66 event, but subsequent investigation revealed that members of the PH1's

The consensus among the range spotters was that the aircraft nose was oscillating and the tail "sort of skidded around," indicating the possibility of a departure from controlled flight.

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family were visiting the range control site for the sole purpose of witnessing the parachute drops and "to watch the plane fly by." They had arrived well ahead of 0900, but departed the site when the word was passed that the A-4 event had been scrubbed. That turned out to be the last fortuitous occurrence of the day.

Within 10 minutes of the family's departure, the lieutenant commander checked in with range control and requested clearance for a low pass by the range control facility. The permission was followed immediately by the appearance of the aircraft on a southeasterly heading at an altitude estimated to be anywhere from 40 to 150 feet AGL.

The aircraft roared by about 100 yards to the west of the Master Photo Control Tower, commenced a rapid pullup, and executed an Immelman-type maneuver to a northwesterly heading, descending to complete a one-half Cuban-8. The pilot made a teardrop reversal to an easterly heading to fly close aboard the target site bull's eye while obtaining permission for a second low pass.

The aircraft was next seen inbound to the control site at about 100 to 160 feet AGL, at high speed, on an easterly heading. About 500 to 600 yards west of the tower, the aircraft changed abruptly to a nose-up attitude, followed by the commencement of a high roll rate to port. The consensus among the range spotters was that the aircraft nose was oscillating and the tail "sort of skidded around," indicating the possibility of a departure from controlled flight. As the bank angle reached about 90-degrees left wing down, the nose fell through and the aircraft impacted the desert floor. The aircraft was destroyed in the impact explosion, and the crew received fatal injuries.

This lieutenant commander had been in the command for about 19 months and was considered to be thoroughly familiar with all aspects of range procedures and aircraft characteristics. He was considered current in the C-47, T-28, F-9 and F-4. The command had evaluated him as a stable and professional officer, with no indication that he had or would deviate from standard flight procedures.

Postmishap investigation, however, revealed a different behavioral profile. Crewmen who had flown with the pilot varied in their opinion of his demeanor, but most agreed that he was thorough and consistent in his briefings and preflights and that he handled inflight emergency situations professionally. The flaw in this lieutenant commander appeared subtly, as a propensity for executing various aerobatic maneuvers not required by the mission. These were often done at the request of a crewman. Some 14 aircrewmen who had flown with the lieutenant commander over the previous 18 months revealed several incidents of previous unauthorized maneuvers.

The command was never made aware of these tendencies toward showmanship. All of the crewmen expressed a reticence to report a well-liked officer.

The Saddest Part Yet. It would be nice to say that these three examples are rare cases, but they're not. Every year we lose lives and aircraft from what appears to be "airshow hysteria." These pilots, and the dozens like them, were not ignorant folk. They did their jobs well, enjoyed flying, and periodically took what they thought were calculated risks. So why are they dead? That's the sad part – no one really knows. Maybe the risks they took weren't so calculated after all. Maybe they forgot that the price for their behavior could be their lives – paid in full. ◄

air breaks

Ridgeline Belly Bumper. A flight of three A-7s was scheduled for a formation, low-level, navigation training mission in mountainous terrain during the day. The pilot who is the subject of this article was assigned as No. 3 of a three-plane triad formation. The thorough briefing which preceded the flight included a discussion of the new location of Checkpoint "D" on the assigned VFR route.

Following a preflight inspection, the No. 3 pilot manned his aircraft and the engine was started. Because the flight was originating from an AFB, there was no qualified A-7 plane captain to assist the pilot during poststart and pretaxi systems checks. This is an important factor since the DAY position on the warning and caution lights panel was inoperative, and it was the pilot's habit to use the warning/caution light panel as his only check of navigation system status prior to taxi. Without the DAY position, the dim lights are extremely difficult to see during daylight hours. This discrepancy had been written up and was known to the pilot. As fate would have it, the pilot began to taxi with the inertial navigation unit mode switch in ground align. This seriously degraded system accuracy.

The flight launched at 1300 local. Once airborne, the No. 3 pilot centered his attention on navigation system management in an attempt to update and improve its accuracy. Approaching Checkpoint "C" of the VR, the pilot selected Checkpoint "D" and observed that the heading and distance indications were not as planned. He then focused his scan inside the cockpit to ensure that he had entered the proper coordinates for Checkpoint "D" (new coordinates were obtained during the brief).

At this point, No. 3 failed to note the increasing terrain contour and his decaying airspeed. He was fast approaching a ridgeline when he finally scanned outside the cockpit. He saw that the aircraft's flightpath was just below the top of the trees at the ridgeline. He immediately applied back stick and felt a moderate buffet as the ridgeline passed beneath the A-7. Since he had experienced similar buffeting crossing previous ridgelines, he attributed its source to turbulent winds. However, realizing that he might have brushed the treeline, the pilot monitored flight/engine instruments for any indication of malfunction. He found none. The radar altimeter was operating properly both before and after ridgeline passage (indexer set at 175 feet). The flight continued as briefed and landed at the destination airfield.

Postflight inspection revealed that the aircraft had indeed made contact with trees on the ridgeline. Sections of both wings and the underside of the fuselage were damaged.

The pilot involved in this mishap was considered to be a competent, professional aviator by his squadron. He had no previous record of flight violations or mishaps. However, he had established a bad habit pattern in regard to the caution lights which eventually led to this mishap. This should serve as a warning to all pilots and aircrewmen – don't rely solely on warning and caution lights to alert you to a problem. Check the position of all switches visually – you might just find one in the wrong place.

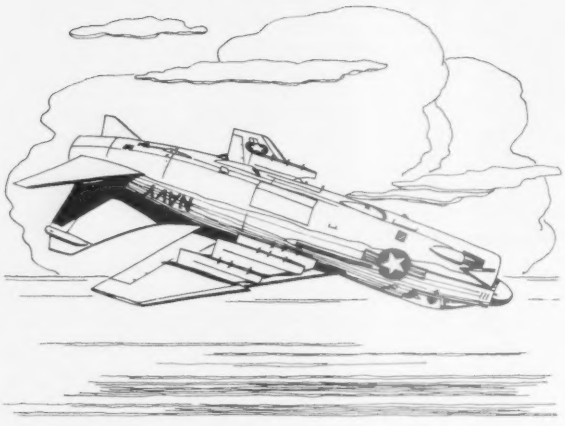
Collision Course. A C-9 aircraft was inbound VMC to the NAS and was given vectors and cleared by the tower for a right turn downwind to Runway 7. At the 180-degree position, the C-9 was cleared to land and instructed by the tower to continue rolling through the intersection of Runways 7 and 13 because of FMLP traffic on Runway 13.

Both the C-9 and an A-3 aircraft in the FMLP pattern on Runway 13 arrived on final at the same time. Following touchdown, the C-9 pilot noted the A-3 was still continuing his approach to Runway 13. Justifiably apprehensive, the C-9 pilot then applied max braking and reverse thrust and came to a stop just short of the intersection of Runways 7 and 13 as the A-3 passed through the intersection at a very low altitude. Later, it was learned the A-3 had been given a waveoff by the LSO just prior to landing. Had the C-9 waved off inclose for any reason, the possibility of a midair collision would have been great.

This near-miss was set up because two aircraft were making simultaneous approaches to converging runways with one runway being controlled by the tower and the other by the LSO. There was an obvious lack of communication between the controllers and the aircraft they were controlling. Had it not been for the positive action taken by the transport aircraft commander to stop his aircraft, an aircraft mishap almost certainly would have been the result. ◄

DO YOU REALLY KNOW?

By LCDR M. D. Moore
VA-25



"HERE I am, 'Mr. Cool,' a competent tailhook aviator with 6 months fleet experience and over 35 traps to prove it. Boy! Those missile profiles we just flew sure were boring. These Orange Air exercises are a pain. Cruising in my A-7 over the water at 200 feet in combat spread is more like it . . . This thin, ragged overcast at 1,500 feet is kind of neat. Wonder if we'll get jumped.

Hey! Lead is breaking left! He must see some bogies. I'll match his climbing turn. Gotta keep sight of lead and find those bogies! Oops, accidentally went in the goo . . . No sweat for a competent, tailhook aviator! I'll just overbank here a little and pull back under the . . . ah, there we go. Now, where's lead? Oops, in the goo again . . . Hey! I'm kinda disoriented here . . . Better do one of those unusual attitude recoveries . . . Let's see, roll to the nearest horizon and pull . . . Ah, good old blue sky. Sure am glad this overcast is thin. Hey, something is funny here. I don't know what it is, but I need some more altitude . . . pull on the stick . . . altitude . . . ALTITUDE! My altitude is decreasing! Holy mackerel! That isn't blue sky! That's the water, and I'm inverted, pulling like hell right towards it! How could I get so screwed up?"

The incident just described actually happened to me several years ago and, since then, has often been in my thoughts. Like all aviators, I try to learn from my mistakes. I'd like to share my reflections on that close encounter with disaster.

What were my mistakes? The first was thinking I was too experienced and too cool to follow the procedures I had been taught for an unusual attitude situation. This "too cocky" mistake has claimed many lives over the years and has been well publicized. Practically everything written about the perils of being arrogant is true and must be heeded.

My second mistake was rolling to the horizon inverted and thinking I was upright. The danger of not really "seeing" what the instruments are showing has also been the subject of numerous safety articles and needs no lengthy discourse here. The problem was that I did not discipline myself to really study the instruments and see what they indicated. An aviator can never afford to let his self-discipline break down, and this is most important in stressful situations.

My third error that day was far more subtle and did not become apparent to me until much later. Some background information is necessary before I describe it.

In *Zen and the Art of Motorcycle Maintenance*, Robert Pirsig cautions that you, as the "mechanic," must always be on guard to "make sure Nature has not misled you into thinking you know something you do not actually know . . . one false deduction about the machine and you can get hung up indefinitely." This caution is absolutely imperative for aviators. False deductions made while flying can lead to disaster, and the pilot must continuously assess his situation to ensure he has not been misled into thinking he knows something he does not.

That day, I got hung up on a false deduction. When I broke out of the clouds the second time, I falsely deduced that the blue I saw was the sky. Then, when I realized something was still wrong, I pulled for the "sky" to gain altitude. It never occurred to me that it was really water. I thought I knew something I did not know, and almost got hung up for good. I was saved only by the altimeter, which showed me the error of my assumptions.

Let me give you another, somewhat less subtle, example of the same mistake. Shortly after launching from the CV on a bluewater tanker mission one afternoon, the MASTER CAUTION light began flashing. Investigation revealed that the oil quantity gauge was reading one-half. My first reaction was anger with the maintenance personnel. I had completed a maintenance turn on the same aircraft the night before and had noted the oil quantity gauge was inaccurate. I griped it that night and, the next morning, learned that the gripe had been signed off with "Found broken wire; repaired same." I was convinced that the problem was still the oil quantity gauge, because of the previous malfunction. Also, I distinctly remembered preflighting the oil level and ensuring the filler cap was secure.

The thought flitted across my mind that since the only problem was a faulty gauge, I could quickly pass my fuel to another aircraft instead of dumping it before returning to the CV. I immediately realized this was *not* an option, since the NATOPS procedure for low oil quantity is to *land as soon as possible.* I felt bad about wasting 7,000 pounds of JP-5 because of a gauge that should have been fixed. Bad, that is, until I landed and discovered that the gauge *had* been fixed and that a leak had depleted my oil supply to less than one-half. Once again, nature had misled me into thinking I knew something I did not actually know. *Luckily, NATOPS stepped in and made my decision for me.* Left with my own deductions, I might have continued to fly the airplane, convinced I had a full supply of oil and a bad gauge.

I am sure that every aviator can think of his own examples of being misled into thinking he knew something he did not actually know. It is a tricky little danger that one must constantly guard against. I used to think I *knew* which way was up. Now I'm more careful about my assumptions. ◄

bravo zulu

LT Loren Harmon

ON a night bombing hop, VA-15's LT Loren Harmon experienced a situation all A-7 pilots dread — severe engine problems! Having pulled off from his fourth dive-bombing run, LT Harmon advanced the throttle to MILITARY but could obtain only 82 percent RPM. He radioed his problem to his wingman, declared an emergency, and commenced a direct emergency profile to NAS Cecil Field. He switched to manual main fuel, which alleviated some instability, but regained only 85 percent RPM. En route to the base, the flight received superb handling from Jacksonville Center and Approach Control. Approximately 10 miles from the field, the aircraft lost effective yaw control. PC-3 hydraulic pressure became erratic, and intermittent electrical problems increased.

LT Harmon set up for a visual precautionary approach to the off-duty runway. The tower quickly cleared the traffic area, and a successful short-field arrestment was made.

A postflight visual inspection of the aft fuselage revealed severe blistering of the paint. Upon further investigation, a ruptured 11th stage bleed air line was discovered in the aft engine compartment. The intense heat had caused extensive damage, with an impending fire and catastrophic flight control failure only minutes away.

The coolness and professional airmanship displayed by LT Harmon, coupled with the aid of his wingman and the controlling agencies involved, resulted in saving a valuable aircraft. ◄

VERTIGO! it can happen that fast

IT's 0300, you're in the nice, warm readyroom watching a movie, and the phone rings. "Launch the alert helo!" This sends you cruelly out into the black on a moment's notice. Been there? It happened to us recently, and if it hasn't happened to you, it probably will. The mission in our SH-3H helicopter was plane guard for an E-2 and fighter launch in response to a distant radar contact. We were rested, briefed, and ready, but less than a minute after takeoff, we found ourselves in serious trouble with no one but ourselves to blame.

We lifted from Spot 4 on the angle, with deck lighting forward of the cockpit well within NATOPS parameters. Power and instruments checked good, wind was on the nose, and soon we were off. Darkness instantly put us on the gauges, without any outside visual reference whatsoever. The weather was low solid overcast, no horizon, no moon. We knew what to expect, as night carrier launches had become routine. This particular takeoff, however, was to prove nearly disastrous.

A standard climbout to 300 feet was commenced, and the Air Boss cleared us for a right-hand turn to cross the bow. Passing through 250 feet, the aircraft inadvertently rolled right into 10 degrees angle of bank. The copilot questioned the pilot, who, after passing 300 feet, accepted this already established turn toward the starboard DELTA pattern. The aircraft continued to roll right, as the pilot was distracted by an OFF flag in the doppler indicator. The pilot broke his instrument scan by dipping his head to check the doppler selector knob while the copilot recycled the switch. The pilot returned to the gauges to note the angle of bank approaching 55 degrees. Neither pilot sensed the excessive turn rate.

At this point, the pilot questioned his attitude indicator but confirmed its reliability by scanning the copilot's instruments. The pilot stated, "I am out of balance." The copilot was engaged in posttakeoff checklist procedures, but this admission caused him to immediately start his own instrument scan. Noting excessive angle of bank and a sink rate over 500 feet per minute, the copilot called for the pilot to level the wings. The pilot failed to correct the aircraft's attitude. The copilot leveled the wings himself and called for power. Both pilots pulled collective, and the descent was checked passing through 200 feet. The copilot talked the pilot through the recovery, and the subsequent climb was terminated at 800 feet. Control of the aircraft was then passed to the copilot. Both pilots were shaken by the incident, and it was several minutes before either felt comfortable enough to descend to the mission altitude of 300 feet. The copilot flew the helicopter for 30 minutes before the pilot reported he was well enough to take the controls. An uneventful 4-hour hop ensued, as a thankful crew welcomed the sunrise.

It must be stressed that the entire incident took no longer than 30 seconds to develop and occurred less than 1 minute after takeoff. It had been the pilot's experience that vertigo built up gradually over time. He had never so rapidly experienced the onset of vertigo/disorientation.

Information on vertigo is readily available to pilots when they open the Instrument Flight Manual to Section III. For those more attuned to medical jargon, extensive reading on the subject can be found in Chapter 3 of the U. S. Naval Flight Surgeon's Manual. Your friendly flight surgeon should be happy to provide you with a copy and help explain what's written. Ours was.

Here are the basics. Equilibrium and the ability to maintain orientation depend on sensations from three sources: the motion-sensing organs of the inner ear, the postural senses of touch, pressure, and tension, and the sense of sight. Lose one, and your equilibrium is subject to impairment. The inner ears sense turns, skids, and slips by registering linear and rotational acceleration and deceleration. How did the workings of the inner ear almost put this helo in the water? Gravity and centrifugal force from a turn combined to form a resultant force that, without outside reference, was interpreted by the pilot as a wings-level sensation. In our case, a momentary break from the instrument scan allowed an inadvertent roll to begin. The pilot became physically accustomed to this angle of bank to the point where it felt like straight and level flight.

The lesson to be learned is that the pilot must disregard or overcome these false sensations and rely on his sense of ***sight*** on the instruments. Once you understand how your senses can provide the brain with false information, you can minimize the chance of disorientation. Recovery from vertigo/disorientation can only be accomplished by reference to the flight instruments with your two eyes.

The following is a partial listing taken from the Flight Surgeon's Manual of flight conditions identified by Navy helicopter pilots to cause vertigo/disorientation. We two first-tour pilots are now familiar with nearly all the flight conditions, environments, or maneuvers listed.

- Perception of the wind through cockpit-side window while in hover or translational lift
- Flying into smoke flares

- Task saturation
- Wave motion interpreted as aircraft motion
- Low-altitude search pattern at night
- Night launch from forward spots on flight deck
- Lack of recent instrument flying
- Communication difficulty (noise, poor radio discipline)
- Excessive translational lift vibration
- Hover not level
- Reflection of anticollision lights
- Vibration dampers on instrument panel inadequate (blurring of instruments)
- Lights from cockpit reflecting on windows

By LTs J. D. Steele and D. Rudloff
HS-12

- Cyclic stick not in neutral position in level flight

Considering the amount of time spent under these conditions, what can be done to help pilots avoid the obvious dangers of vertigo/disorientation? The following four suggestions will help you stay out of the water some dark night.

- Remain convinced that you cannot fly by the "seat of your pants."
- Do not unnecessarily mix flying by instruments with flying by visual cues.
- Aim to make an early transition to instruments when flying in poor visibility. Once established, stay on instruments until use of external cues is clearly practical.
- Maintain high proficiency, and practice flying under IFR conditions.

Now let's assume the worst has happened. You find yourself disoriented and, worse yet, losing control of the aircraft. The attitude indicator reads 40 degrees left wing down, but you swear you're straight and level. It's so dark outside there may as well be black curtains on the windows. The VSI is displaying a 300-foot-per-minute descent. Your heartbeat has jumped up, and you're sweating profusely. Commonly, this increased anxiety serves only to accelerate disorientation. Now what? These procedures could save your life as well as your crew's.

- Get on the instruments; check and crosscheck. Ensure good visual instrument illumination.
- Maintain instrument reference. Control the aircraft in order to make the instrument panel display the desired flight configuration.
- Maintain a correct instrument scan; do not omit the altimeter.
- Use advanced headwork on necessary control actions in those maneuvers that typically produce confusion (e.g., Night/IFR transition to hover).
- Seek help if severe disorientation persists. Give the controls to the copilot, inform ground control and other aircraft, and check your altimeter.

Vertigo/disorientation is a severe problem and frequently a significant factor in aircraft mishaps. Senior pilots are not immune to the physiological phenomenon that leads to disorientation. Be safe by being aware of how your body can deceive you. Get on those instruments, and trust them with your life.

The MAR '80 through OCT '80 issues of APPROACH (minus the JUL '80 Anniversary issue) contain a seven-part series on disorientation and vertigo. This series is very informative and, best of all, easy to read. –Ed.

STAY CLEAR OF THAT

By LCDR G. H. List
HSL-35

". . . he began to let out angle of bank, a little angry with himself for sloppy airwork, but the gyro continued to roll. Realizing something was wrong, he cross-checked his other instruments."

WHILE drinking a beer at happy hour, I overheard a friend relating this piece of a story to a group of fellow aviators. With my interest stirred, I listened intently, asked questions, and later reconstructed the following series of events.

The mission was a C-1A logistics flight to deliver a crate of flares for use in a bombing derby. The flight called for an early Saturday morning departure from NAS Coast to NAS Inland and required the crossing of a rather significant mountain range en route.

The crew, well rested and eager to make the flight, consisted of two lieutenant (jg) transport plane commanders, one E-4 plane captain, and a lieutenant (jg) NFO along for the flight time.

The weather brief was very encouraging. It was to be a beautiful, June day with unrestricted visibility, no precipitation, light turbulence over the mountains, and no significant

CUMULO GRANITE

cloud or thunderstorm activity except for a line of thunderstorms north of the flight plan route. All things considered, it promised to be a simple flight.

Preflight, start, runup, and takeoff were all uneventful. The initial leg of the flight was westbound at 6,000 feet, with the aircraft commander at the controls. After 30 to 40 minutes of flight time, the copilot moved from his seat to use the lavatory in the aft cabin. On his way aft, the copilot sent the NFO forward to occupy the copilot's seat and assist the plane commander if needed. At this time, the direction of flight changed, to the east, and after receiving clearance, a climb to 9,000 feet was accomplished.

After leveling off, the plane commander noted that the OAT had fallen to +10° C and adjusted the alternate air to maintain carburetor air temperature at +20 to +25° C. Having flown little in the past year, the NFO began asking questions about the aircraft and IFR procedures in order to enrich his experience level prior to transferring to a new squadron. The copilot, who had returned to the cockpit, observed the exchange of information and elected to sit in the passenger compartment for the time being and read a magazine.

Nearing the mountain range, which crossed the flightpath from left to right, the aircraft commander noted that a cloud layer was beginning to build below the aircraft. In the distance, he observed clouds approaching flight level. He knew that the minimum en route altitude would soon become 12,000 feet and that 13,000 feet would be his altitude assignment for an easterly route of flight. Therefore, the aircraft commander, wishing to continue his conversation, remain VFR, and continue the flight without climbing above 10,000

feet for lengthy periods (if required to climb, he wanted to remain as low as possible) requested and received clearance for VFR on top at 11,500 feet.

Leveling off at 11,500 feet, now over the mountains, the aircraft commander observed that the thunderstorms, forecast to be north of his route of flight, were moving toward his intended flightpath at an alarming rate. He also noted that the clouds were building vertically very rapidly and exceeding his flight level by thousands of feet. At this point he requested and received from Center an amended clearance to deviate to the south of his original flightpath for thunderstorm avoidance. Center advised him that, once on his new course, he would have to climb higher to meet the minimum en route altitude requirements. The plane commander then canceled his VFR on top clearance and requested an IFR clearance at 13,000 feet, the minimum en route altitude for his direction of flight.

Upon reaching 13,000 feet, the aircraft commander, who had been preoccupied with weather and clearances, decided to use the oxygen bottle behind his seat. The bottle, however, was stuck and could not be freed from his position in the pilot's seat, so he ignored it. At this point the thunderstorms and clouds had completely blocked the route of flight. Recognizing the futility of proceeding, the aircraft commander requested and received clearance away from the thunderstorm.

To comply with the new clearance, a standard rate turn was commenced to the right for what was intended to be 180 degrees of heading change. The flight subsequently went IFR and encountered moderate turbulence. While IFR in the turn, the aircraft met with considerable buffeting, which was distracting but not intolerable. It was then that the aircraft commander noticed that the pilot's attitude gyro had exceeded 30 degrees angle of bank and was well on its way toward 45 degrees. At this point, he began to let out angle of bank, a little angry with himself for sloppy airwork, but the gyro continued to roll. Realizing something was wrong, he cross-checked his other instruments. The turn needle indicated a slight turn, while the attitude gyro showed a 90-degree right turn. Next, he noted that his airspeed was rapidly falling toward zero. He lowered the nose immediately but noticed no gain in airspeed. The turbulence had intensified, and his VSI was flickering ±800 feet. He lowered the nose further, without an increase in airspeed, but the altimeter began to unwind like a defective alarm clock. He rolled wings level on the turn needle, reduced power on the engines, and started a gradual pullout. The copilot, sensing difficulties, came forward and replaced the NFO in the copilot's seat. After strapping in the seat, he freed the oxygen bottle from behind the pilot's seat, turned it on, and took several breaths before passing it to the aircraft commander and assuming control of the aircraft.

The aircraft commander looked up from the instrument panel to find, much to his chagrin, that *the windscreen was obscured by clear ice*. He quickly looked to the left and saw ice covering the leading edge of the wing, the engine nacelle, the prop dome, and the propellers themselves. He immediately switched on the pitot heat, selected FAST on the propeller de-icing system, and turned the wing and tail de-icing system on. Almost immediately, the ice began to break away from the wings. Propeller ice, loosened by the heated propeller de-icers and flung outward by centrifugal force, sounded like hail on a tin roof as it struck the fuselage. With a jerking motion, the airspeed needle climbed back to cruise airspeed. The aircraft commander attempted to contact Center on both UHF and VHF frequencies, without success. He tried to determine his position with VOR and TACAN, to no avail. All the aircraft's antennae were iced over. He set 7600 in the transponder and descended to the minimum en route altitude.

Clear of the clouds but still above an undercast layer, he pulled out a VFR sectional chart and checked his heading on the G-2 compass. "Zero nine zero degrees, no way! We're heading southwest, according to the wet compass."

Now the pieces fit together. The pilot's instrument inverter had failed, taking with it the pilot's attitude gyro and compass.

The aircraft commander fixed his position by picking out distant landmarks and drawing lines of bearing on his sectional chart. His copilot then flew courses recommended by the aircraft commander in order to remain in the vicinity of the assigned route of flight until communications could be re-established with Center.

Later, as the OAT increased, the ice fell away from the antennae, and normal navigation and communications were regained. The flight returned to the NAS of origination and landed uneventfully.

Wow! I thought to myself. These guys were prime candidates for buying some real "cumulo granite." Nevertheless, reflecting over the flying experience I had just heard, two key questions kept resurfacing in my mind.

Pointedly, I asked my friend, "When flying above 10,000 feet, why didn't you use the oxygen bottle located behind your seat?"

He answered, "I ran 5 miles three times a week and participated in a rigorous physical fitness program. I thought I could fly above 10,000 feet for short periods with no problems. Besides, *the senior pilots I flew with routinely flew above 10,000 without using oxygen.* Most thought it was a bother to use. Why, I even remember one occasion when we flew at 15,000 feet without oxygen."

Interesting, I thought, as my next question came to mind. "When you encountered unforecast weather, why did you elect to continue through a hole in the clouds even though the clouds were rapidly building and thunderstorm activity was present?"

He replied, "I thought I could slip through the line of thunderstorms without any problems. *When I was a copilot, most of the aircraft commanders I flew with routinely did the same thing.* Besides, the Ops officer would have chewed me out for not completing the mission."

As I considered the information presented to me, I was troubled by the reference my friend made to the example of "senior pilots" and "aircraft commanders." Clearly, at least two negative attitudes toward flight safety were instilled in a relatively inexperienced aviator by more experienced aviators. Perhaps they were small points, but often, small points add up to a fatal tragedy if left unattended. Consequently, I began to reflect over my last 3 years as a RAG instructor. Had I set a good example for the fleet replacement pilots I flew with? Did I instill the proper attitude toward flight safety in my copilots? I guess only time will tell, and then I may read about it in a mishap report or hear about it at happy hour.

How about you, the RAG instructors, NATOPS officers, aircraft commanders, and senior single-seat guys, should your performance be emulated?

Are you setting a good example?

When surprises are no fun

By LCDR Skip Miner
VP-16

DO you remember your last instrument check? An instrument takeoff is part of the checkride. How much thought did you give to that portion of the flight? Did you cheat a little and glance outside to see how the runway edge markers looked? Did you even *do* an ITO? Did you check your heading indicator (HSI) with the runway centerline prior to releasing the brakes? Did you crosscheck your attitude source on the roll? How about your final landing? Did you again check the HSI against the runway heading, or did you roll out looking at the runway, without checking inside? In short, when you are on the runway for either takeoff or landing, do you scan your flight instruments for alignment and proper indications? These are not idle questions, as the following two incidents indicate.

A P-3C was preparing for a night takeoff from Southeast Coast AFB for the final leg of a roundrobin instrument training hop. The PPC was in the right seat, and the nugget third pilot was making the takeoff. The weather was IMC, with rain showers and thunderstorms. (You can't buy experience like that.) After completing the takeoff brief, full power was applied, and the crew was off and rolling. Acceleration was very rapid, as the aircraft weighed only 92,000 pounds for the last leg. When the copilot called, "Eighty knots," three sets of eyes checked the shaft horsepower gauges to ensure the engines were developing the predicted SHP. When the pilot at the controls looked outside again, visibility was restricted to the windshield, as they were in a heavy rain shower. Simultaneously, the copilot called, "Rotate," and the aircraft was off. Or *was* it? The pilot experienced a series of updrafts and downdrafts immediately after rotation. All his concentration was centered on maintaining runway heading and a 5-degree noseup attitude. The aircraft seemed to hold itself at 50 feet and 140 knots IAS. During these first few seconds, attitude and heading control were critical as the outside environment assailed the aircraft. Finally, after a solid downdraft, the aircraft popped out on the other side of the rain shower and continued climbing and accelerating. The cockpit crew finally exhaled passing 5,000 feet for FL200.

The second incident was not only just as exciting but more deceptive, due to the CAVU weather conditions. At the completion of an all-night patrol from NAF North Atlantic, the aircraft proceeded to a Northern European NATO airbase for debrief. It had snowed during the night, and the tower advised that the runway was covered with 3 inches of snow. The crew, however, was more concerned with the length of the runway (6,500 feet) and the field elevation (6,000 feet). On final, everything looked fine. The weather was beautiful, and the edge lights had been turned on to clearly define the runway area. The PPC, concerned about the runway length, touched down at the numbers and quickly brought the power levers into REVERSE, knowing that wheel braking was marginal at best. As the aircraft began to slow, a wave of blowing snow engulfed the forward section of the aircraft. The visibility instantly became 0/0. The PPC quickly transitioned to the gauges and shouted, "I'm on instruments, heading 161!" He then gently brought the power levers forward while the copilot split his attention between the HSI and the outside, looking for the runway lights. Within a few seconds, the snow cloud dissipated, and the aircraft was still on centerline below 50 knots with 3,000 feet remaining. It was an exciting ending to an otherwise tranquil patrol.

I experienced these two incidents as a third pilot during my first year as a fleet replacement pilot in a P-3C squadron. After 12 years of military flying, I have had numerous other "heart-stopping" events, but none have remained so crystal clear in my mind as these two. Therefore, as a special-card pilot, my checkflights always include an ITO and, on final landing, a reverse on instruments after touchdown. Surprises in the airplane remind me of my daughter's comment after her first roller coaster ride . . .

"That was no fun!" ◄

THE HUMP

By LT Bill Lawler
HS-12

AT long last, the hump has arrived. The end of the cruise, going home to your family, and seeing your friends again seems to be more of a reality than it was so many months ago. Today, after so many blue Mondays, our safety standdown focused on just that – *the same old thing* – and the fact that this sameness can and will kill you if you let it.

Although midcruise daydreaming is a fairly standard safety topic on standdown days, it started hitting close to home when our speaker cited many examples I found myself guilty of on a regular basis. I've always been safety conscious, and it was a bit unsettling to realize how lax I had become in just a few short months. Suddenly, I understood precisely why the midpoint of a cruise was such a popular safety topic.

How many briefs, preflights, and overall flight preparations have been "blown off" under the guise of operational necessity? Being part of a CV helicopter squadron requires a bit of extra effort. The pace is often hectic in meeting commitments ranging from alert ASW launches to logistics flights. Amid the chaos of scrambling for a night, man-overboard launch or any regularly scheduled event, there must be patient, careful planning to avoid turning the rescuer into the rescuee.

After months of flying with the same crew in the same aircraft, it becomes all too easy to lose your sense of the present tense. For the many different situations we encounter, it simply isn't good enough to accept "same brief as always," then kick the tires, light the fires, and go. Being a nice guy is great, but it is an aircraft commander's responsibility to see that the crew is wearing flight gear properly and is thoroughly briefed on missions and procedures. People tend to accept briefs and preflights of lesser and lesser quality and just sit back, doing nothing about it. If an aircraft commander gives a poor brief, help him out. The potential hazards of a poor brief apply equally to every member of the crew.

To avoid much of the sameness associated with flying on an extended cruise, change of any nature is usually welcome and may prove quite useful – particularly a crew change. Although it's difficult to get out of a scheduling rut, try to fly occasionally with a different crew. This not only breaks up the routine of flying with the same faces but will have a positive effect on the quality of briefs and preflights.

As crews are rotated, the need to be fully standardized becomes more obvious. This not only helps the entire crew feel more prepared mentally for the task at hand but also broadens your own aviation knowledge as you discuss flying. Also, it gives you a chance to see how other crews perform their jobs, compare their techniques to your own, and adopt the best techniques for yourself.

Those same blue Mondays are difficult beasts to fight, for they require *constant* attention. Even a week after the most profound, hardhitting safety lecture, many of us are right back where we started unless someone is there to splash water in our faces.

To a professional aviator, that splash should not be necessary, but frequent safety lectures and a highly visible safety program *can* counteract a good deal of this unconsciousness. And for those few individuals who require that bracing splash of self-recognition, let's give it to them – before they have to inflate their LPAs. ◄

We do not endorse wholesale crew changes at mid-cruise, but carefully controlled inter-crew changes may produce the renewed attention to detail suggested by the author. – Ed.

High on air

By Russ Forbush
APPROACH Writer

MORE than 4 hours into a night carrier ASW flight over the North Atlantic, the pilot of an S-3A experienced a slight chill and queasy feeling. He donned his mask, went to 100 percent oxygen, and began to breathe as deeply and rapidly as possible, hoping the oxygen would make him feel better. Within minutes, he noticed a tingling sensation in his extremities, which progressed to a generalized tingling with tunnel vision and mental clouding. The *Viking* was at an altitude of 11,000 feet MSL with a cabin altitude of 5,000 feet MSL.

The pilot was well rested, well fed, and had felt fine prior to the flight. No fumes had been noted inside the aircraft, and none of the other crewmembers were experiencing similar symptoms. The aircraft cabin temperature had been fluctuating as a result of a temperature control failure in the automatic mode, so the pilot had switched to manual in an attempt to stabilize the cabin temperature.

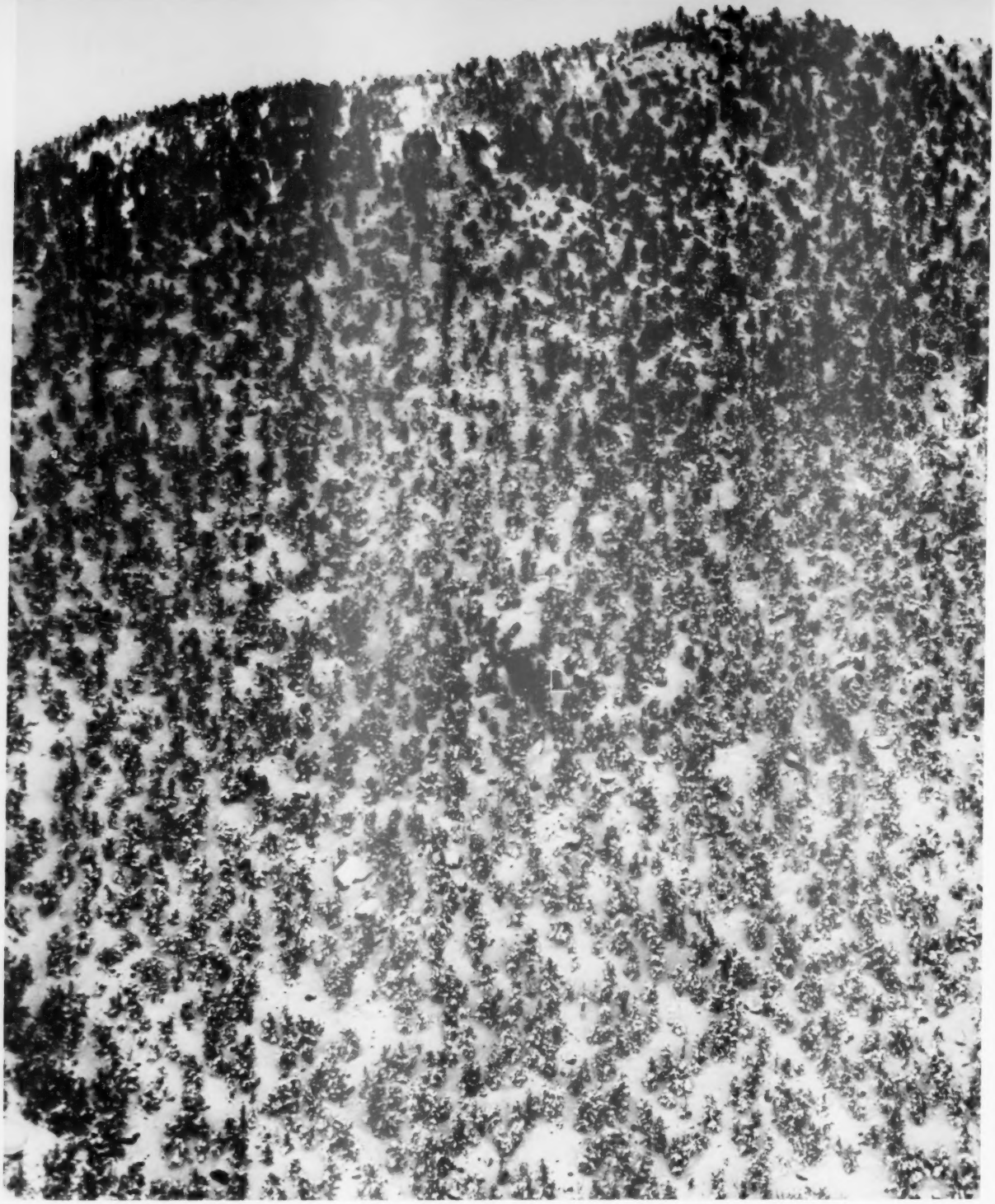
As soon as the pilot began to feel impaired, he declared an emergency, descended to 5,000 feet MSL, and returned to the carrier for an arrested landing. He was met at the aircraft by the flight surgeon, taken to the flight deck battle dressing station, and thoroughly examined. Initially, he exhibited signs and symptoms of hyperventilation, but the symptoms cleared rapidly during the examination. Routine laboratory studies (including urinalysis, serum electrolytes, complete blood count, and serum glucose) were within normal limits.

It was the flight surgeon's opinion that the pilot had experienced a slight chill as a result of the fluctuating aircraft environmental control system temperature, and he had responded by hyperventilating.

The commanding officer's comments regarding this hazard follow. "This is considered to be an isolated case of hyperventilation. An experienced naval aviator, this pilot perceived he was experiencing physical difficulty and attempted to correct the problem through the use of oxygen. When his condition worsened, he immediately declared an emergency and commenced a descent to stabilize the cabin temperature with auxiliary ventilation. Divert was not considered as an option, since the *Viking* was in proximity to the ship and the pilot desired to land at once. His approach to the ship was graded OK by the LSO. His early recognition and admission of a problem resulted in a successful shipboard recovery. The pilot is to be commended for the professional manner in which he handled a potentially disastrous situation."

The lesson to be learned from the above hazard report is – when a pilot feels his physical condition is impaired while airborne, his immediate reaction should be to attempt remedial action and, if this fails, declare an emergency and land at the first opportunity, as this pilot did. Over the years, some of our naval aviators have waited too long to take action. This led to catastrophic results.

The correct responses for hyperventilation are: control your anxiety; be alert to early warning signs (air hunger, apprehensive feelings of unreality, dizziness, faintness, numbness and tingling of face and extremities, pounding of heart, hot and cold sensations, cramps, muscular stiffness, euphoria); decrease your breathing rate; 100 percent oxygen may help (take a deep breath, hold your breath for 10 seconds, let your breath out, and continue breathing slowly); and seek a lower altitude. Note, it is frequently difficult to differentiate between symptoms of hypoxia and hyperventilation. –Ed.



"As the aircraft neared the mountain, the pilots sighted the 45-degree slope and thought they were in a nosedown attitude. Both pilots pulled back on the cyclic and up on the collective. Rotor RPM decayed, and the low RPM audio signal came on as the aircraft impacted tail-first along the mountain slope." (The helo can be seen in the center of the above photo.)

WELL-MEANT *but Hell-bent*

By Russ Forbush
APPROACH Writer

IT was late afternoon when the phone rang at the NAS flight clearance desk. The duty watchstander answered, and the voice on the other end of the line identified himself as a doctor from a nearby hospital. He told the watchstander he had a civilian patient in critical condition as a result of multiple spinal injuries and requested a MedEvac to transport the patient to a better equipped hospital. The request was made to the NAS, since it was the only activity in the area with a thorough helicopter MedEvac capability. The watchstander informed the doctor that he would have to obtain a SAR authorization number. Following his conversation with the doctor, the watchstander contacted the CDO and told him about the SAR request. The CDO then phoned the hospital to verify the patient's condition and was told by the attending physician that moving the patient quickly was a matter of life and death.

At 1655, the flight clearance watchstander alerted the duty SAR crew, and the CDO called the NAS CO to brief him on the proposed flight. The CDO was instructed to call the CO back with weather information and the SAR HAC's assessment of the situation.

A SAR authorization number was received at 1712. The HAC was notified, and he proceeded to Flight Planning for a briefing while the copilot, first crewman, second crewman, and corpsman went to maintenance to prepare for the flight. After being briefed on the MedEvac request by the CDO, the pilot received a verbal weather brief from the duty forecaster. The forecast en route was for marginal to poor flying conditions, with ceilings of 500 to 1,000 feet overcast, marginal visibility in light rain and snow showers, and moderate icing conditions at 16,000 feet and below.

Based on the forecast weather, the HAC decided that VFR flight below 500 feet (AGL) would be possible by following a series of paved highways to his destination. The HAC and CDO then briefed the CO on the planned route and forecast weather conditions. The HAC told the CO his intentions were to return to the NAS or land and wait for daylight if weather prevented VFR flight. With this understanding, the CO authorized the flight.

The pilot proceeded to maintenance and, upon arrival, decided to drop the second crewman from the flight. This action would ensure the H-1 was below weight limitations and allow room for the patient and attending physician. The auxiliary fuel tank was filled with 130 pounds of JP-5, and the crew computed takeoff weight to be less than 9,800 pounds. Since the copilot had already completed preflight and prestart checklists, the HAC manned the pilot's seat, buckled up, and started the *Huey*. The crew was then briefed on the mission, and takeoff followed at 1749.

Once airborne, the HAC and copilot discussed the weather brief. To save time, the pilots decided to deviate from the planned dogleg flight route and fly directly into a valley which appeared suitable for transit. As the helicopter approached the mountains at the south end of the valley, it became apparent to the pilots that they could not be crossed VFR. A 180-degree turn was executed, and the decision was made to pick up a dirt road directly to the east and head south along it to a second valley.

Continued

The road was located, and although it was snowing, the crew was able to maintain contact with the road at altitudes between 100 and 500 feet AGL by turning on the landing and search lights. The snowfall became more severe as the helo headed southwest towards a powerline running northwest to southeast through an alkali flat. After passing over the powerline, the crew decided to turn back and attempt to follow it southeast to a state highway. The snow was now coming down by the bucketful, and with reduced visibility, the pilots decided to abandon the powerline for fear of impacting it. The dirt road was relocated, and the pilot landed the aircraft on it. The crew discussed the possibility of remaining overnight at this location, but after about 15 minutes, the snow began to slacken, and the decision was made to press on. At 1922, the helo launched. The pilots intended to fly along the dirt road, but shortly after takeoff, the crew encountered a dry lake bed, and all visual reference was lost. At this point, the HAC attempted to land, but could not hold a stable hover. The aircraft drifted right, and the left skid hit the ground. From here on in, things went from bad to worse.

Both pilots became disoriented, and control of the aircraft changed back and forth between the pilots several times. The pilots finally decided that an instrument takeoff was the best course of action, and the copilot initiated one. He commenced a stable instrument climb in a southeasterly direction headed *towards an 8,500-foot mountain.* As the aircraft neared the mountain, the pilots sighted the 45-degree slope and thought they were in a nosedown attitude. Both pilots pulled back on the cyclic and up on the collective. Rotor RPM decayed, and the low RPM audio signal came on as the helo impacted tail-first along the mountain slope.

"During the aircraft roll, an internal fuel cell ruptured and all crewmembers were splashed with JP-5. The crewman and corpsman were saturated, while the pilots received a minor dousing."

The aircraft rolled over three times as it tumbled down the slope, finally coming to rest against a tree some 150 feet from the impact point. During the aircraft roll, an internal fuel cell ruptured, and all crewmembers were splashed with JP-5. The crewman and corpsman were saturated, while the pilots received a minor dousing. Fortunately, there was no fire. Other injuries were minor, and all crewmembers were ambulatory.

Using onboard survival equipment, the crew set up camp adjacent to a large rock nearby. After setting a PRC-90 to broadcast the emergency beacon, the crew retired for the night. At 2045, the NAS CDO was notified by the county sheriff that the SAR helo had not arrived at its destination. The CO and Operations officer were notified, and a search of highways by law enforcement agencies began. Since the deteriorating weather precluded launching additional SAR helos, a nearby AFB was notified of the missing status of the aircraft, and a SAR authorization number was assigned to search for the helo.

At approximately 0700 the following morning, an HC-130 was launched to conduct an ELINT (electronic interception) search for the missing helo. Civilian Air Patrol (CAP) and NAS aircraft had launched at first light to aid in the search, and the helo was located by midmorning. The HC-130 vectored a Marine Corps helicopter to the rescue site, and the crew was picked up and returned to the NAS. The crewman and corpsman were put in sickbay when it was discovered that both of them had first-, second-, and third-degree burns over 55 percent of their bodies as a result of being splashed with JP-5. They were out of service for 2 weeks. The helo was totalled.

There were several factors that led to this mishap, not the least of which was the exceptional dedication of the two pilots. Each had flown many successful SAR and MedEvac mis-

sions in the past, both as HACs and as copilots. They were proud of these accomplishments and strongly motivated to continue them. There is little doubt that the critical condition of the patient and the need to move him quickly weighed heavily in favor of attempting this mission. This was borne out during the weather brief, when the pilot latched onto the forecaster's statement that he "might be able to complete the flight if he followed a series of paved highways to destination." The forecaster later stated, "The pilot gave the appearance of showing a lack of concern for the weather." It appears the HAC had already decided to go "come hell or heavy snow."

Prior to flight, during his conversation with the CO, the HAC played down the weather and told the CO that if the weather deteriorated, he would either return to the NAS or land and remain overnight. With this stipulation, his launch was approved. Immediately after takeoff, he deviated from his planned flight route by flying directly into the valley. He never sighted the paved highways and eventually used a dirt road as a reference. Although he had flown this particular route on several occasions, the weather became so bad he really didn't know where he was. If there was ever an appropriate time for a pilot to remain on the deck, it was after he landed on that dirt road.

The copilot was also a factor in this mishap. Although he didn't receive a thorough weather brief from the pilot, he was aware of the intended route, yet he offered no objection when the pilot deviated from it. He was fully aware that the flight was to be aborted if the weather precluded safe flight, but he failed to recommend this action as the snow showers increased. He also concurred with the HAC's decision to relaunch after having landed on the dirt road.

As the situation worsened, crew coordination came apart. Both pilots were subjected to disorientation and vertigo. Control of the aircraft changed hands about 12 times during the period just prior to the crash. *Neither pilot recognized that they were approaching a mountain. Instead, they mistook the slope for level ground, thought they were in a nosedown attitude, and both pulled back on the cyclic and up on the collective.* The helo ran out of turns and settled tail-first onto the mountain slope.

"The aircraft rolled over three times as it tumbled down the slope, finally coming to rest against a tree some 150 feet from the impact point."

The final contributing factor associated with this mishap was supervisory. It can best be described by quoting, in part, from the comments of the NAS CO:

"Both the pilot and copilot are well experienced in the mountain SAR environment and have track records for good judgment. This one lapse in judgment, by both of them, cost an aircraft and nearly cost four lives. Air station policy calls for launching of the SAR helo to be authorized only by the CO, XO, or Operations officer – in that order. Factors to be considered include the time sensitivity of the victim's condition, the weather, and aircrew experience. In authorizing the launch in this instance, the CO received only the pilot's version of the weather – which sounded more optimistic than that of the forecaster. The point is, if the decision to launch is to be elevated above the HAC, then the person making the decision should require more information than just the HAC's estimate of the situation. In this case, where there was some question about the weather, the decision-maker should have personally received the weather forecaster's brief."

Dedication is an important trait in a naval aviator, but it must be tempered with good judgment. The mere fact that a pilot is highly experienced and well qualified for a particular mission is not grounds for undertaking a flight that has a strong possibility of failure. Both of these pilots were dedicated to picking up a critically injured patient and delivering him to a facility that could possibly save his life. This is understandable and commendable, but by pressing on into steadily deteriorating weather and endangering the lives of the crew, these pilots went from well-meant to hell-bent. ◄

Benjamin Franklin once said: "Dost thou love life? Then do not squander time, for that's the stuff that life is made of."

How to get burned on a log run

By LCDR J. J. Kavale
HC-11

IT was to be a standard log run in support of a WESTPAC-bound carrier battle group. Launch one H-46 from USS HOMEPLATE, tour all the ships in company, and land aboard USS CARRIER. Offload, fuel, and take off with any passengers, cargo, or mail for the return leg around the battle group.

On this particular day, USS CARRIER remained in the vicinity of Small Island, which had an airstrip that could be used as a bingo/divert field. The remainder of the battle group continued westward at slow speed. The first half of the afternoon log run was accomplished in a routine manner, and all ships were serviced on the inbound leg. The helo was then refueled, loaded with incoming mail, and launched on its outbound leg. Just prior to switching to the helo control frequency, the pilots of the H-46 heard a call from an A-7 with engine problems declaring a divert into the airfield at Small Island, a portent of things to come. The switch to helo common was made, and USS SMALLBOY was informed the helo was inbound with "pony." Just as USS SMALLBOY informed the helo that it had a green deck, a call on Guard told the helo to switch back to USS CARRIER for an important mission. The switch was performed, and the helo was told to return to USS CARRIER and load a five-man team to be flown to Small Island to repair the A-7, which had successfully landed.

The helo landed aboard USS CARRIER, and all parts, tools, and the repair crew were loaded, along with 12 emergency leave passengers (with their *Samsonite* luggage). This addition delayed the takeoff considerably. With darkness approaching, the helo landed at Small Island and offloaded all gear and passengers. The accumulated flight time totaled 6 hours thus far, so the helo was shut down for a dynamic component inspection. Having completed the inspection, the helo was started, engaged, and the now anxious crew took off to refuel aboard USS CARRIER and head home.

With refueling complete, the helo took off into what had become a totally black night. Following procedures for a night takeoff, the ASE (automatic stabilizing equipment) was engaged and climbout begun. The aircraft commander, with many thoughts on his mind (including a 60-mile transit back to USS HOMEPLATE), relied on instinct in his flying. He depressed the CDRB (centering device release button), which totally negated the stabilizing element of the ASE. Fighting vertigo, and with only the help of the copilot, he established control after multiple climbs, descents, and a 270-degree turn. Cockpit coordination was reestablished, and the helo was headed for home.

Multiple tries to reach HOMEPLATE on UHF were unsuccessful. The LF homer could not be tuned nor identified, but USS CARRIER was providing radar vectors (the reassuring voice of the controller gave some comfort to the crew, who had been in the aircraft about 8 hours). At 45 miles from USS CARRIER and with still no joy from HOMEPLATE, the sole UHF radio quit. After trying several other frequencies, the crew signaled radio failure using the IFF, and the helo finally ambled back to USS CARRIER. An uneventful landing completed the 9½-hour "routine" log run.

The crew spent the night aboard USS CARRIER and, the next morning, flew back to USS HOMEPLATE. It was discovered that the distance between USS CARRIER and USS HOMEPLATE had been **90 miles** vice 60 the night before.

It is very easy when sitting in a cockpit, totally preoccupied with a mission, to get so involved with the perceived and real operational pressures that one loses sight of flight safety. Still, that goal rests with the aircraft commander, who is expected to be flexible in the performance of his mission.

This evolution is a perfect example of flexibility turning into a can of worms. The aircraft commander realized his limitations after landing with the radio failure by deciding to remain on deck, even though repairs had been completed. He should have made that decision prior to the aborted flight to HOMEPLATE, since he had a tired crew, was facing a demanding flight, and had no operational need to return. ◄

Faraway places

By LCDR Sid White III
VP-8

PREPARATIONS for deployed operations are intense among all hands. Admin types orders. OPs plans the schedule. Training pushes crew qualifications. Maintenance *peaks and tweaks* the birds. But what does *SAFETY* do?

Two major philosophies seem to guide safety programs. You either hope that nothing goes wrong, or you plan ahead to minimize problems. Let's look at the second way of doing business – safety's predeployment hazard detection work. In what areas are problems likely to be different once you leave your home base for exotic foreign shores, skies, and seas?

Problems With Mother Nature. If your home base is blessed with year-round sunshine and fair weather, what about your deployment site? Ground pounders and fliers need training beforehand about safe operations in rain, high wind, low visibility, thunderstorms, cold temperatures, ice, high humidity, etc. If you head South, think about heat prostration, sunburn, local diseases, more thunderstorms, and insects (on men and in pitot tubes). Will special equipment be needed (like foul weather gear, extra lights for maintenance, heaters, coolers, extra tiedowns, extra aircraft covers) in addition to what you use at your home base? Forewarned is forearmed.

Problems With Work and Living Spaces. A predeployment visit or survey will teach you a lot. Who will go into which spaces? Do the spaces have safe lighting, ventilation, access, power, water, equipment, fire alarms, and telephone communications? Do they flood, rattle in a strong breeze, or shelter bugs, snakes, and rabid dogs? Are there plenty of fire extinguishers and first aid supplies? Do hazardous materials have proper storage and handling areas? Do unique noises, falling rocks, slick pavement, or other hazards exist at the site? Look at these critically on a liaison visit, and develop a plan of action (training, labeling, repair, and supervision) to reduce the dangers. If you deploy aboard ship, work with the vessel's safety department to eliminate or manage hazards. Talk to the safety officer in the departing squadron.

Problems With Airfield Facilities. Hazards may not be correctable at the squadron level, but most can be avoided with adequate attention, supervision, and education. Some locations, whether divert fields or deployment sites, have notoriously unreliable communications and navigation aids. Think through and talk through the potential catastrophes and alternatives. Which instrument approaches work best and pose the least safety hazard? Where is the dangerous terrain in your operating areas? What are the alternate airfields like? Does your flight deck or ramp area have adequate tiedown points, lighting, grounding, and FOD surveillance? Do crash crews know how to handle emergency problems with your aircraft (hot brakes, personnel rescue, hazardous equipment/ordnance)? Does everyone speak English? (You may need to pass information in a hurry.) Is the water safe? Are the local eateries safe? These may seem routine to you, but "normal" at home may be "exceptional" at your remote base or ports of call.

Problems With Liberty. Frequently, we manage to keep a safe working environment and then lose man-hours, material, and men to recreational accidents. Advance work with your men prepares them for deployment site or liberty port hazards. Local driving rules (or lack of them), dangers (roads, animals, poor vehicle maintenance), and habits ("macho" drivers, erratic signals, stopping suddenly) will catch an unsuspecting American. Drinking is a problem everywhere, but particularly in a strange locale. A buddy system on liberty may be advisable. An advance look at potential problems out in town will enable your squadron to establish procedures and training to counter them.

Problems Left Behind. It is good to plan against deployment site hazards, but the same applies for family hazards you leave behind. Are family cars in top shape for the next 6 months? Does your home have a smoke alarm, fire extinguisher, and first aid kit? Do friends and family know how to handle emergencies and get help? Have your kids had safety training (by you, the Red Cross, or whomever) for their boating, swimming, cycling, firearm, hobby, and driving activities? Have you checked your furnace and other appliances for safe operations? A safe and successful deployment will be ruined by a tragic, *preventable* accident at home.

The Bottom Line. Deployment safety is the result of advance recognition of hazards and the action you take to minimize them. Look ahead critically. Educate your people about potential hazards. Assemble the specific materials you will need that you might not routinely have at home. Train supervisors and demand compliance with safety procedures and common sense. Stay safe, and enjoy those faraway places with strange-sounding names.

Sections of the Aviation Safety Review Checklist, published by the Naval Safety Center, can be used as a guide for your predeployment survey. The checklist items should be answered as if you were already in your new location. A followup survey should be conducted after your unit is in the new location to correct any newly-identified hazards. – Ed. ◄

letters to the editor

From an Astronaut

Houston, TX – I read with interest LCDR Dewald's article on "Experience by Proxy" in the OCT '81 issue. It reminded me of my experience after ejecting from a burning RA-5C in the ACLS pattern at Patuxent River in 1973.

I had taken the short "CAG" course in the *Vigi* at Albany, GA (thank goodness) and remember distinctly at the time I went through the ejection trainer that I hoped I would never have to eject from this beast. I would probably reach for the alternate ejection handle (which is between the crewman's legs on most Navy aircraft) and find nothing there. I envisioned losing critical seconds as I then went for either the primary face curtain or the "twist and pulls" *outboard* of the pilot's legs in the North American seat.

My long-feared ejection was at low altitude, and time was critical. Even though it had been about 9 months since my checkout, I immediately moved my left hand from the throttles to the left twist and pull and ejected. Score one big one for ejection trainers.

As the chute blossomed, I saw a fireball below me and then returned my attention to preparing for water entry. Everything by the numbers: disconnect my oxygen mask, fingers on the koch fittings. As my feet touched the water, I released the fittings and must have gone 10 feet underwater. Oh no, a successful ejection and now I'm going to drown. I popped back to the surface (due to the buoyancy of the trapped air in my suit and equipment). What's the next step? Get the raft deployed, climb in, and enjoy the warm July day. As I fumbled with the seat pack release, down I went again. I dog paddled to the surface and again tried to get to the raft fittings. I sank below the surface once more. *Don't panic! Something's wrong. Why do I keep sinking? Dog paddle to the surface. Dummy – inflate your life preserver!* Pop! Pop! The LPA inflated and a broad grin broke out on my face. To heck with the raft. I had been seconds away from earning the epitaph in LCDR Dewald's article: "Pilot dead; cause, drowning; reason, unknown."

I highly endorse his proposal of encouraging experience by proxy. A little imagination can go a long way. It could even save your life!

CDR Frederick H. Hauck, USN
NASA Astronaut

C-130s: Slip Sliding Away

RAF Mildenhall, England – I read with great interest your article, "Unchocked and Unmanned," in the Air Breaks section of the JUN '81 issue. It related the incident of a parked C-130 on an RON at NAF SOUTHPAC jumping its chocks on a windy night and traveling 100 yards before stopping, undamaged, against a concrete curb.

I didn't think there was a C-130 pilot left in the Navy who, when leaving his or her aircraft, would not doublecheck chock and tiedown security, especially after a well-publicized incident at NAF EASTMED a couple of years ago.

In that incident, a C-130 was parked on a lollypop, with standard transient line chocks. The parking brake was released in accordance with NATOPS, and the aircraft was left overnight. Wind was light and variable with no forecast change, but during the night, there were wind gusts in excess of 60 knots. This C-130 also jumped the chocks and began a wayward journey, stopping only after the radome kissed a light pole (radome lost), the nose gear smacked the concrete base of the same light pole (nose gear lost) and, simultaneously, the left wing inboard of the No. 2 engine bludgeoned another light pole (the wing won after giving up only about 18 inches). The aircraft commander was the squadron's NATOPS officer, the flight engineer was the FE NATOPS Examiner, and the loadmaster was an LM NATOPS Instructor.

Needless to say, the lessons learned were to **always** properly secure a C-130 on an RON with tiedowns or approved chocks and maintain a read file in the squadron of all C-130 accidents and incidents from all services because, *yes, you guessed it*, the same thing had happened before.

It has often been said that pilots are a lot like hotrodders and truckers. After they park their machines and walk away, they just can't help looking back. Next time you do that on an RON, think about the feelings you'll have if it isn't there when you come back in the morning.

CDR Albert A. Herndon, Jr., USNR
USCINCEUR Airborne Command Post

CAUTION - *Read the Label*

San Diego, CA – While listening Monday morning to the usual weekend experiences, an interesting one caught my attention. One of our aviators who owns several horses walked in, not looking too well, and said, "I just about did myself in this weekend because I didn't read the whole label." Now, he really had my attention.

He said that a pesticide had been purchased at a local tack dealership for fly control in his stables. After reading the instructions on how to properly mix the ingredients, and using a hand pump sprayer, the solution was liberally applied in and about the stables. Since it was in the instructions not to apply to foodstuffs and eating areas, care was taken not to do so. But, the mist from the spraying was inhaled and absorbed through the skin of our aviator.

Approximately 1 hour after the spraying, the first effects began to take place. A mild stomach ache was first noticed, and thinking he was hungry, he proceeded to shower and fix himself something to eat. An hour or so later, the effects were getting worse, in the form of shortness of breath, chest pain, and a real grand stomach ache. Only then did he remember the spray and went back to read the label.

He found out the WARNING said: "Vapor harmful. May be fatal if swallowed, inhaled, or absorbed through the skin." This is a very serious outcome to the user, especially since the front of the bottle simply says to keep it away from children.

A lesson well learned – **read the whole label**. If he hadn't taken a shower prior to eating, he very well may have ingested enough to do severe harm. Upon examination by a physician, it was learned the active ingredients affected the nervous system and our aviator was indeed very lucky to be with us.

LCDR J. W. Hyde
Aviation Safety Officer
NAS North Island

Contributors Wanted

APPROACH is always interested in contributed articles and photos. To save you time and increase the chances of your contribution being published, we have printed a Contributor's Guide. For a free copy of this handy booklet, please write to: Naval Safety Center, Safety Publications Dept. (Code 7521), NAS Norfolk, VA 23511 or call Autovon 690-1321.

APPROACH welcomes letters from its readers. All letters should be signed though names will be withheld on request. Address: *APPROACH* Editor, Naval Safety Center, NAS Norfolk, VA 23511. Views expressed are those of the writers and do not imply endorsement by the Naval Safety Center.

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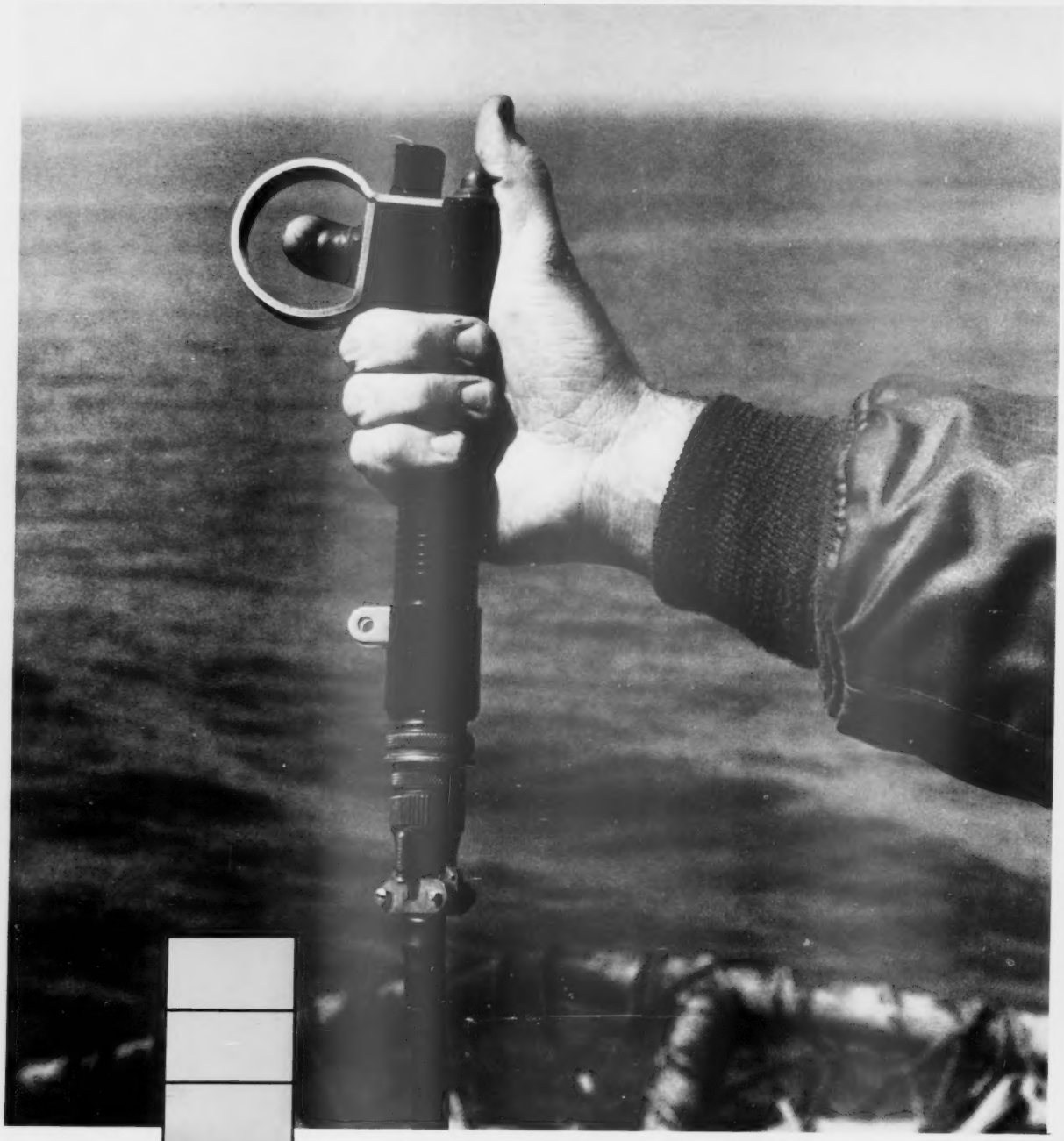
Experience isn't the best teacher, if you can't use it.

Anon.

THE HAND OF FATE



D N'T TEMPT IT!

Naval Safety Center
NAS Norfolk, Virginia

Poster idea contributed by LCDR J. B. Love, LSO, CVW-15